

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (currently amended) A database system comprising:
 - a center server;
 - a single or a plurality of local servers;
 - a first network for mutually connecting said center server and said local servers;
 - a plurality of local storage subsystems for storing local databases managed by said local servers;
 - a center storage subsystem for storing replications of said local databases; and
 - a second network for mutually connecting said center server, said center storage subsystem, said local servers and said local storage subsystems, wherein:
 - said center server includes replication requesting means for sending a database replication request to each of said local servers for requesting said local servers to replicate the local databases and data consolidating means for performing a process for consolidation of consolidating the replicated local databases so that said center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem; and
 - ~~each of said local servers~~ server includes local database freeze requesting means responsive to the database replication request to request a

database management system to freeze said local database, and database replicating means for causing said local storage subsystem to replicate, in said center storage subsystem, said local database stored in said local storage subsystem, and

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

2. (currently amended) A database system according to claim 1, wherein:

said center storage subsystem includes said replication local databases representing replications of said local databases stored in said local storage subsystems;

each of said local storage subsystems includes remote volume replicating means for transferring information of an update applied to said database to said center storage subsystem through said second network; and

said center storage subsystem reflects the transferred update information upon said replication local database.

3. (currently amended) A database system according to claim 1, wherein:

each of said local storage subsystems includes remote volume splitting means for temporarily stopping transfer of update information between said

local database and said replication local database and remote volume resynchronizing means for resuming the transfer of update information between said local database and said replication local database and transferring the update information accumulated in said local storage subsystem during interruption of the transfer of update information to said center storage subsystem; and

a local database freeze operation and a remote volume split operation are executed on the basis of the request for database replication made to said local server from said center server and said local database is split from said replication local database to thereby synchronize these databases mutually.

4. (currently amended) A database system according to claim 1, wherein:

said local server includes remote volume split completion notifying means for informing said center server that the split by said remote volume splitting means is completed, and local database freeze release requesting means for requesting release of the freeze of local database; and

when the split between said replication local database and said local database is completed, said local server issues the remote volume split completion notice and a local database freeze release request.

5. (currently amended) A database system according to claim 1, wherein:

said center storage subsystem includes shadow images of said replication local databases, volume replicating means for reflecting the update

information applied to said replication local databases upon said shadow images, volume splitting means for temporarily stopping the reflection of update information upon said shadow images, and volume synchronizing means for resuming the reflection of update information upon said shadow images;

said center server includes center database freeze requesting means for making a request for database freeze of said shadow images and center database freeze release requesting means for making a request for release of freeze of said shadow images; and

said center server receives a remote volume split release requesting notice to issue the center database freeze request and volume synchronization request and when synchronization of volume is completed, executes the volume split operation and issues the center database freeze release request.

6. (currently amended) A database system according to claim 1, wherein:

said center server has a replication source managing table for managing whether replications of replication source local databases are completed; and

when synchronization between all the local databases managed by the local storage subsystems connected through said first and second networks and the replication local databases corresponding to all of said local databases is completed, said center server issues the center database freeze

request, volume synchronization request, volume split request and center database freeze release request.

7. (currently amended) A database system according to claim 1, wherein:

said center server includes data consolidation completion notifying means for informing said local servers of completion of data consolidation; and

each of said local servers includes remote volume resynchronization requesting means responsive to the notice by said data consolidation completion notifying means to request said remote volume resynchronizing means to resume transfer of update information between said local database and said replication local database.

8. (currently amended) A center server in a database system having a center server, a single or a plurality of local servers, a first network for mutually connecting said center server and said local servers, a plurality of local storage subsystems for storing local databases managed by said local servers, and a second network for mutually connecting said center server, center storage subsystem, local servers and local storage subsystems, wherein

said center server includes replication requesting means for sending a database replication request to each of said local servers requesting said local servers to replicate the local databases and data consolidating means for performing a process ~~for consolidation of~~ consolidating said replicated

local databases so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem, and

each local server includes local database freeze requesting means responsive to the database replication request to request a database management system to freeze said local database, and database replicating means for causing said local storage subsystem to replicate, in said center storage subsystem, said local database stored in said local storage subsystem, and

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

9. (original) A center server according to claim 8 further comprising:

means responsive to a notice of remote volume split completion based on a request for replication made to the local databases to request database freeze applied to shadow images of said replication local databases, means for requesting volume synchronization, means for requesting volume split when synchronization of volume is completed to perform volume replication for reflecting information of updates applied to said replication local databases upon the shadow images, and means for requesting center database freeze release.

10. (currently amended) A method for accessing a database system having a center server, a single or a plurality of local servers, a first network for mutually connecting said center server and said local server, a plurality of local storage subsystems for storing local databases managed by said local servers, a center storage subsystem for storing replications of said local databases and a second network for mutually connecting said center server, center storage subsystem, local servers and local storage subsystems, wherein:

said center server sending a database replication request to each of said local servers requests said local servers to replicate local databases and performs a process for consolidation of consolidating said replicated local databases so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem, and

each of said local servers server responds to a request for database replication from said center server to request a database management system to freeze said local database and cause said local storage subsystem to replicate, in said center storage system, the local database stored in said local storage subsystem, and

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

11. (currently amended) A database system access method according to claim 10, wherein:

said local storage subsystems transfer information of updates applied to said local databases to said center storage subsystem through said second network; and

said center storage subsystem reflects the transferred update information upon replication local databases representing replications of said local databases stored in said local storage subsystems.

12. (currently amended) A database system access method according to claim 10, wherein:

said local storage subsystems respond to a request from said local servers based on a request for replications of local databases made by said center server to said local servers to temporarily stop the transfer of update information between each of said local databases and each of said replication local databases so as to split remote volumes and respond to a request for resynchronization based on a database consolidation completion notice from said center server to said local servers to resume the transfer of update information between each of said local databases and each of said replication local databases so that the update information accumulated in said local storage subsystems during interruption of the transfer of update information is transferred to said center storage subsystem to perform remote volume resynchronization.

13. (currently amended) A database system access method

according to claim 10, wherein:

said center server responds to a notice of remote volume completion to request freeze of databases corresponding to shadow images of said replication local databases and request volume synchronization to synchronize a ~~bitmap~~ portion between the shadow images and the replication local databases, and when the synchronization of volume is completed, requests volume split to perform volume replication for reflecting the update information applied to the replication local databases upon the shadow images and thereafter requests release of the center database freeze.

14. (currently amended) A process program for executing a

process in a center server in a database system having said center server, a single or a plurality of local servers, a first network for mutually connecting said center server and said local servers, local storage subsystems for storing local databases managed by said local servers, a center storage subsystem for storing replications of said local databases, and a second network for mutually connecting said center server, center storage subsystem, local servers and local storage subsystems, said process program comprising:

a module for sending a database replication request to each of said local servers making a request to said local server for replication of said local database so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem;

a module for receiving a notice of remote volume split completion based on the replication request made to said database;

a module for requesting database freeze of a shadow image of said replication local database;

a module for requesting volume synchronization;

a module for requesting volume split when the volume synchronization is completed to perform volume replication for reflecting update information applied to the replication database upon the shadow image; and

a module for thereafter requesting release of freeze of the center database,

wherein said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

15. (currently amended) A process program for executing a process in a local server in a database system having said center server, a single or a plurality of local servers, a first network for mutually connecting said center server and said local servers, local storage subsystems for storing local databases managed by said local servers, a center storage subsystem for storing replications of said local databases, and a second network for mutually connecting said center server, center storage subsystem, local servers and local storage subsystems, said process program comprising:

a module responsive to a request for database replication of said

database from said center server to request a database management system to freeze said local database so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem;

a module for requesting said local storage subsystem to cause it to replicate, in said center storage subsystem, said local database stored in said local storage subsystem;

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases,

a module for receiving a notice of split completion from said local storage subsystem based on said replication request; and

a module for informing said center server of the split completion.

16. (currently amended) A database system comprising:

a center server;

local servers;

local storage subsystems which store local databases; and

a center storage subsystem which stores replication local databases representing replications of said local databases, wherein

said local servers are mutually connected through a first network;

said center server, said center storage subsystems, said local servers and said local storage subsystems are mutually connected through a second network;

said center server includes a replication requesting unit which sends a database replication request to each of said local servers and requests said local servers to replicate local databases and a data consolidating unit which performs a process for consolidation of consolidating said replicated local databases so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem; and

~~each of said local servers-server~~ includes a local database freeze requesting unit responsive to a database replication request from said center server which requests a database management system to freeze said local database, and a database replicating unit which causes said local storage subsystem to replicate, in said center storage subsystem, said local database stored in said local storage subsystem; and

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

17. (currently amended)A database system according to claim 16, wherein:

each of said local storage subsystems includes a remote volume replicating unit which transfers information of an update applied to said local database to said center storage subsystem through said second network; and
said center storage subsystem includes a volume replicating unit which reflects the transferred update information upon said replication local database.

18. (currently amended) A center server in a database system,
wherein:

said center server is connected to a single or a plurality of local servers through a first network and is connected to said local servers, local storage subsystems which store local databases and a center storage subsystem which stores replications of said local databases through a second network;
and

said center server includes a replication requesting unit which sends a database replication request to each of said local servers to request requests said local servers to replicate said local databases, and a data consolidating unit which performs a process for consolidation of said replicated local databases so that center server can access to a plurality of replicated databases of said local databases at substantially the same timing in a consolidated manner in said center storage subsystem.

each local server includes local database freeze requesting means responsive to the database replication request to request a database management system to freeze said local database, and database replicating means for causing said local storage subsystem to replicate, in said center

storage subsystem, said local database stored in said local storage subsystem, and

said local server controls to freeze said local database in response to the database replication request by inhibiting subsequent updates of said local database and stopping sending of update data to said center server, said update data being used to update replicated local databases representing replications of said local databases.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.